

In re Patent Application of:

SHI ET AL

Serial No. 09/891,886

Filed: 06/26/2001

REMARKS

Claims 1-6, 8-10 and 12-18 are pending in this application.

Claims 1, 2 and 6 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kitamura in view of Liu.

Claims 3, 4 and 5 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kitamura in view of Liu as applied to claim 1 above, and further in view of Stockill.

Claims 8 to 10 and 12 to 18 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kitamura in view of Liu as applied to claim 1 above, and further in view of Hessel.

Claims 1, 10, and 16 have been amended to overcome the objections of the Examiner and to define more clearly the invention in light of the prior art.

Amendments to Claims

To emphasize the distinction between prior art and instant application, the following phrase has been appended to Claims 1, 10 and 16:

"including at least one of message error rate MER, I/O data constellation, equalizer tap values and forward error correction FEC readings".

The basis for this addition can be found in the specification on e.g. page 13 in the paragraph starting "The test meter 30 is thus operative...".

In Claim 10, "bitstream " has been added to the phrase "to obtain a demodulated signal", and the phrase "obtained digital CATV

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signal" has been replaced with "demodulated bitstream signal" for improved clarity.

The basis for this amendment can be found in the specification on e.g. page 15, first paragraph in the phrase "The test meter 30 thus demodulates the RF input signal to obtain a digital bitstream of the television channel".

In order to avoid confusion of the user interface in cited prior art with the functionality of that defined in instant application, the following phrase has been added to Claim 1:

"and to receive the analysis output containing at least one of video information, audio information, a composite bitstream, closed captioning information and ratings information for display to a user".

The basis for this addition can be found in the specification in middle of page 15.

Response to Arguments

The *Universal Test Meter for Digital Signal Distribution Systems* as disclosed in instant application provides a substantial advantage over prior art in that it can be applied to analyze the quality signals in CATV and other digital networks operating under different digital standards, such as the European, North American and others. No alterations of the instrument are required to customize it to local conditions, since the in-built standards are operator selectable.

The test meter differs from prior art in that it is more than just a receiver for CATV signals. It can provide a measure of signal quality and diagnosis based on the analysis of various performance parameters. A standard receiver may give an indication

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of a deteriorated signal, however without providing additional information, which can be used in diagnosing a network problem and finding its root cause.

1. Rejection of Claims 1, 2, and 6

Claims 1, 2, and 6, rejected under 35 U.S.C. 103(a) as being unpatentable over Kitamura in view of Liu, as set forth on pages 5-8 of the outstanding Office Action, are respectfully traversed.

Kitamura's and Liu's disclosures lack several of the features defined in instant application, as will be shown. The motivation of both Kitamura and Liu is toward a TV receiver for sale and use in USA and Europe. This contrasts with the motivation of instant application toward a test meter, which can supply analyzed data on the performance of CATV networks operating under USA or European standards, thereby enabling efficient detection and early diagnosis of performance degradation.

Rejection of Claim 1

The Office Action alleges that instant invention would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains, based on the disclosure of Kitamura (U.S. Patent 4,303,944). The Office Action states on page 3 that:

"Kitamura discloses a test meter for a digital signal distribution system comprising:

a front end for acquiring a signal carried by the signal distribution system (column 1, lines 37-48;
Note: a television is interpreted as being a simple test meter as a user will be able to determine the

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signal strength by observing the television output);"

Applicant believes this statement to be inaccurate on several counts.

Kitamura discloses a simple network of a diode, transistor and fixed and variable resistors which produce a set of voltages for controlling an electronic tuner (see for instance Col. 3, TABLE 3) in a TV receiver. The tuner could be applied to U.S. and European VHF television channels (Col. 1, lines 37-48; Col. 4 lines 12-15, which refers to Figs. 4, 5a and 5b; Claim 1).

It is suggested in the office action that the disclosed television receiver may be usable as a "simple tester" to indicate low signal strength. A person skilled in the art would not likely regard the test meter claimed in instant application as a "simple tester" due to its inherent capability, complexity and set of features. Whether a "simple tester" could extract a signal strength measurement from a deteriorated image on a TV screen is highly questionable, particularly when there is a manifold of other possible causes with similar symptoms. It is doubtful whether a skilled person would accept a TV receiver as a test meter, as defined in instant application.

In any case the cited disclosure contains no provision or means for an analysis of the received signal, which could help in diagnosis of malfunctions. For instance, in Fig. 1 of Kitamura, the video output of the television set is shown as going to a cathode-ray tube for display in the form of an image for viewing by a user.

Claim 1 of instant application defines a means for signal analysis, which is not disclosed or suggested by Kitamura:

"a means for analyzing at least one parameter of the demodulated signal to produce an analysis output".

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The text cited in the office action (col. 1, lines 37-48) as disclosing "a means for analyzing at least one parameter" is in actual fact simply a reference to a switching circuit for obtaining various tuning voltages for USA and European system VHF TV channels. Applicant can find no reference to a means for analyzing or analysis results in the given excerpt from Kitamura's disclosure.

Although in the interpretation of the Examiner "video output" is a parameter to analyze, it does not appear to have any bearing on where or how results or output from any type of parameter analysis would become apparent or be used in Kitamura's disclosure.

Applicant does not understand how the mere mention of USA and European TV systems could be interpreted as the "digital CATV standards" claimed in instant application. Kitamura's statement is quite general and lacks teaching in this respect.

With a test meter according to instant invention, a person skilled in the art would be enabled to utilize the analysis of parameters such as these for detection and diagnosis of pending malfunctions, marginal malfunctions or minor malfunctions before deterioration in the image quality of the CATV signal would become noticeable. For instance, a rising error correction rate could indicate deteriorating channel conditions, while the correction mechanism would maintain image quality. To a person skilled in the art, this could indicate a pending malfunction, which would be invisible to a viewer using the television receiver according to Kitamura.

Kitamura himself makes no mention of "test meter" or "test instrument", nor does he imply that his invention can be used as one. Kitamura's disclosure is silent on key aspects defined in Claim 1, such as "CATV", "CATV standards", "analysis", "user

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interface", "digital signal".

Furthermore, in Claim 1 of instant application, the claimed test meter includes:

"a plurality of signal conditioning circuits, each signal conditioning circuit corresponding to one digital CATV standard in a plurality of digital CATV standards"

Careful reading of Kitamura reveals that his teaching is directed at a voltage circuit for switching and tuning an electronic tuner (reference number 1 in Figs. 1, 2 and 4) with an integrated switching circuit (reference number 20 in Figs. 2 and 4). There is no mention of a plurality of signal conditioning circuits. Kitamura's disclosure does not describe the electronic tuner in any detail. So, no teaching can be found in his disclosure on how, if at all, it fulfills the signal conditioning circuit function claimed in instant application.

Kitamura presents only a single band amplifier (reference number 2 in Fig. 1, prior art), which could be applied to signal conditioning. Thus his disclosure has no counterpart to the plurality of user-selectable signal conditioning circuits, each corresponding to one digital CATV standard claimed in instant application.

Lastly, Claim 1 of instant application defines

"a user interface operative to allow a user to select the digital CATV standard and to receive the analysis output containing at least one of video information, audio information, a composite bitstream, closed captioning information and ratings information for display to a user."

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The four switches S1 - S4 (col. 2, lines 19-21) in Kitamura's disclosure may be liberally interpreted as a user interface, however with user input capabilities only.

That Kitamura's "user interface" is used only for input (i.e. a user selection) distinguishes it substantially from instant application, which claims a bi-directional user interface, accepting input from a user and providing output of useful analysis information to the user.

In summary, Kitamura's patent does not disclose, imply or direct toward a test meter with a plurality of user-selectable signal conditioning circuits each corresponding to a digital CATV standard, signal analysis means and a user interface, all of which are claimed in instant application.

In the Office Action, Liu et al. is said to disclose

"a test meter of Claim 1 wherein the CATV signals are digital (column 1, line 67; column 2, lines 1-8) and with a digital demodulator in communication with said signal conditioning circuitry and operative to select one demodulation scheme from a plurality of digital demodulation decoding schemes to obtain a demodulated signal from the digital channel signal after signal conditioning (column 5, lines 3-7)."

Clearly, Liu's invention is directed toward one aspect of digital data communication systems and methods for operating such systems, namely the timebase synchronization of a receiver to a remote transmitter (column 2, lines 11-14). Additionally, a combined 64/256-QAM and 8/16-VSB demodulator is disclosed (column 5, lines 3-5), referred to also as a dual mode QAM/VSB receiver (column 5, lines 21-22).

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Liu's disclosed system with a front-end programmable gain amplifier (PGA) controlled by an on-chip gain recovery loop does not possess a test meter functionality. Notably, amended Claim 1 of instant application recites:

"a means for analyzing at least one parameter of the demodulated signal to produce an analysis output including at least one of message error rate MER, I/O data constellation, equalizer tap values and forward error correction FEC readings".

The claimed means for analyzing finds no counterpart in Liu's disclosure.

Furthermore, Liu does not teach a user interface operative to allow a user to select the digital CATV standard as claimed in Claim 1 of instant application. While the dual mode QAM/VSB receiver may be seen to imply some sort of selection of digital CATV standard, there is no indication that the selection is under control of the user. Typically, such a selection could be performed with jumpers in the factory. Alternatively, a host processor may select the standard according to some preprogrammed table (col. 7, lines 21-24) without user involvement.

While the motivation of both Kitamura and Liu is to create a television receiver capable of being sold in the United States and Europe, there is no indication of how such a television receiver would be capable of performing as the test meter claimed in instant application. It is argued that a consumer product (television receiver) differs substantially from a technician's tool (test meter) in terms of construction, user interface, analysis capabilities and target market. Thus a motivation toward a consumer market can be seen as teaching away from the test meter as defined in instant application.

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In conclusion, applicant respectfully submits that the disclosures of Kitamura and Liu omit or fail to direct towards several substantive aspects of the present application, nor do they provide any motivation for a person skilled in the art. Thus Claim 1 cannot be deemed obvious.

Rejection of Claim 2

With respect to Claim 2, Liu is said to disclose the test meter of claim 1, wherein the plurality of digital CATV standards comprise ITU-T J.83 Annex A, Annex B, and Annex C (column 5, lines 9-10) and the plurality of digital demodulation decoding schemes comprise QAM and QAM variants (column 5, lines 3-7).

When Liu refers throughout to dual mode QAM/VSB receiver systems (e.g. col. 1, lines 17-18), he is not describing a receiver with "a plurality of signal conditioning circuits, each signal conditioning circuit corresponding to one digital CATV standard".

He is actually referring either to two modes of intermediate frequency (IF) input signals (e.g. col. 5, lines 34-39) or dual mode of operation - quadrature amplitude modulation (QAM) or vestigial sideband modulation (VSB) (e.g. col. 7, lines 43-45). Upon detection of a channel change request (col. 7, lines 14-28), a host may direct the receiver 10 in Fig. 1 to download specific configuration. Thus no selection occurs between a plurality of signal conditioning circuits, counter to what is claimed in instant application. Furthermore, Liu's teaching is rendered somewhat unclear due to the missing reference number '10' in Fig. 1.

Liu teaches the separate handling of ITU-T J.83 Annex A/C (col. 6, lines 55 - 58) and Annex B (col. 7, lines 1 - 3) CATV standards, notably in the number of general functions performed. This difference appears to be in the software or firmware of the

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host processor, but not embodied in separate signal conditioning circuits.

Throughout his disclosure, components for only one standard at a time are presented, e.g. components associated with Annex B such as a 6MHz SAW filter to limit out-of-band energy (col. 5, lines 40-43), or the NTSC rejection filter(s) (col. 9, lines 50-64; Fig. 1, reference number 28; fig. 4, reference number 56). Thus his teaching does not include or direct towards a plurality of signal conditioning circuits each corresponding to one of digital CATV standards comprising ITU-T J.83 Annex A, Annex B, and Annex C, thereby differing substantially from instant application, as recited in Claim 2.

Thus Claim 2 would not have been obvious from Liu's disclosure to a person with ordinary skill in the art at the time of the invention.

Rejection of Claim 6

Kitamura states that the television set is provided with four switches, of which one (S_3) is switched so as to select a television channel (col. 2, lines 19-25).

Claim 6 cannot be deemed obvious by virtue of its dependence on Claim 1, which cannot be regarded as obvious in view of Kitamura and Liu as argued earlier.

2. Rejection of Claims 3, 4, and 5

Claims 3, 4, and 5, rejected under 35 U.S.C. 103(a) as being unpatentable over Kitamura in view of Liu, and further in view of Stockill, as set forth on pages 8-10 of the outstanding Office Action, are respectfully traversed.

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Rejection of Claim 3

In the Office Action, Stockill is said to disclose the test meter of Claim 1, wherein said plurality of signal conditioning circuits comprises a first filter that filters the acquired signal in accordance with a first CATV standard and a second filter that filters the acquired signal in accordance with a second CATV standard (column 4, lines 3-13).

Stockill is motivated to receiving data encoded in or carried by TV signals (e.g. col. 1, lines 8-11) and the demodulation of low bandwidth digital teletext broadcast from satellites in the sub-carriers of the main television signal (col. 2, lines 54-63, col. 4, lines 54-59. As the demodulation of broad bandwidth digital CATV signals are not an object of his disclosure, he is seen to be teaching away from the test meter for digital CATV systems claimed in Claims 1 and 3 of instant application.

To enable the extraction of teletext to be performed from signals of US, UK and European broadcasting standards (col. 4, lines 3-13), he discloses a series of bandpass filters (66a-c in Fig. 4) for adjusting the received signal bandwidth appropriately.

However, Stockill does not disclose the digital demodulator operative to select one demodulation scheme from a plurality of digital demodulation decoding schemes, which is recited in Claim 1 of instant application. Neither does he provide for a means to analyze the digital signal and output analysis results, as is the case in the same Claim 1.

Thus, at the time of the invention it would not have been obvious for one of ordinary skill in the art to add the parallel filtering taught by Stockill to Kitamura's and Liu's systems to arrive at the test meter claimed here.

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Applicant respectfully submits that there are several substantive aspects of the present application, which are either absent or cannot be inferred from the disclosures of Stockill, Kitamura and Liu. Neither do they provide motivation for a person skilled in the art for combining the three disclosures. Thus Claim 3 cannot be deemed obvious.

Rejection of Claim 4

Careful reading of Liu's disclosure reveals that he does not disclose the test meter of Claim 3, wherein the first and second filters comprise SAW filters each according to its own digital CATV standard. Liu discloses the only a single SAW filter to limit out-of-band signal energy (col. 5, lines 39-42). There is no suggestion or direction given for adding additional SAW filters, as the single SAW filter adequately fulfills the requirements for the dual mode QAM/VSF receiver of Fig. 1.

Since Claim 4 recites the presence of two SAW filters, it cannot be deemed obvious or be derived from the combined disclosures of Kitamura and Liu.

In addition, Claim 4 cannot be deemed obvious by virtue of its dependence on Claims 1 and 3, which cannot be regarded as obvious in view of Kitamura, Liu and Stockill as argued previously.

Rejection of Claim 5

Liu recognizes the existence of two transmission mode standards, one defined by ITU-T J.83 Annex A/C for outside the U.S. and one defined by ITU-T J.83 Annex B for inside the U.S. (col. 1, lines 51-64), as well as a need for a television receiver system capable of demodulating a variety of modulation formats (col. 1, lines 65-67; col. 2, lines 1-3). He does not, however, disclose a

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system where each of the above standards is implemented in its own corresponding signal conditioning circuit in the same apparatus.

The apparatus claimed in Claim 5 of instant application recites a plurality of signal conditioning circuits, each corresponding to a digital CATV standard, wherein "first digital CATV standard comprises ITU-T J.83 Annex A and said second digital CATV standard comprises ITU-T J.83 Annex B".

Thus the disclosures of Kitamura and Liu do not give substance or motivation for rendering Claim 5 obvious.

3. Rejection of Claims 8-10, and 12-18

Claims 8-10, and 12-18, rejected under 35 U.S.C. 103(a) as being unpatentable over Kitamura in view of Liu, and further in view of Hessel, as set forth on pages 10-11 of the outstanding Office Action, are respectfully traversed.

Rejection of Claim 8

According to the Office Action, Hessel discloses the user interface recited in Claim 8 (column 4, lines 38-46).

Turning now to the cited description, Hessel states:

"FIG. 3 describes a field programmable radio frequency communications system that can be programmed by a user to form a digital signal processing system 10 that is adapted to be coupled to a radio frequency receiver and or transmitter subsystem 12 to configure a radio frequency receiver and/or transmitter system to operate with any of a plurality of radio frequency waveforms or signaling schemes, such as, AM, AME, A3E, H3E, J3E, CW, SSB, M-PSK, QAM, ASK, and angular modulation, such as, FM, PM, FSK, CMP, MSK, CPFSK etc."

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The motivation for Hessel's disclosure is to improve a radio performance through a refinement of carrier frequency estimate method, which is to various degrees dependent on the type of modulation and signaling used. The radio frequency waveforms or signaling schemes he lists are very general, many of which do not even apply to signals as used in a network such as digital CATV. In the absence of more specific teaching, his disclosure contains nothing that directs or suggests a preferred way for extending the capability of a digital CATV network analysis apparatus.

Furthermore, Hessel does not teach a plurality of signal conditioning circuits, each such circuit corresponding to one digital CATV standard, which is claimed in Claim 1 of instant application.

Claim 8 is dependent on Claim 1 with an additional restriction that the user interface is operative to allow a user to select one digital modulation decoding scheme from a plurality thereof. The claimed user interface also comprises the output of analysis results, which has no counterpart in Hessel's disclosure.

In the absence of motivation and substance, Claim 8 cannot be deemed obvious for one of ordinary skill in the art from the disclosures of Kitamura and Liu in view of Hessel.

Rejection of Claim 9

Claim 9 is dependent on Claim 8, which in turn depends on Claim 1.

Although Liu discloses the demodulation of 64/256-QAM (col. 5, lines 3-7) that may be regarded as a plurality of digital demodulation schemes, he does not provide for a user interface operative to select one digital modulation decoding scheme, which is claimed in Claim 8 of instant application.

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Therefore Claim 9 cannot be deemed obvious from the disclosures of Kitamura and Liu.

Rejection of Claims 10 and 16

The examiner has rejected Claims 10 and 16 on the same grounds as Claims 1 and 8.

The same arguments as used in defending Claim 1 apply also to Claims 10 and 16, both of which have been amended as recited earlier.

Applicant believes that with the above amendments, the grounds for rejection have been removed also from Claims 10 and 16.

Rejection of Claim 12

The examiner has rejected Claim 12 on the same grounds as Claim 1.

As Claim 12 is dependent on Claim 10, it is believed that with introduced amendments the grounds for rejection of Claim 12 have also been removed.

Rejection of Claim 13

The examiner has rejected Claim 13 on the same grounds as Claims 3.

Claim 13 is dependent on Claim 12, so it is believed that with introduced amendments to Claim 10 on which Claim 12 depends, the grounds for rejection of Claim 13 have also been removed.

Rejection of Claim 14 and 17

The examiner has rejected Claims 14 and 17 on the same grounds as Claim 5.

Since Claim 14 is dependent on Claim 10 via Claims 12 and 13,

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and amended Claim 10 is deemed not to be obvious over Kitamura and Liu, it is believed that the grounds for rejection of Claim 14 have also been removed.

Claim 17 is dependent on the amended Claim 16 for which it is believed that the grounds for rejection have been removed.

Rejection of Claim 15 and 18

The examiner has rejected Claims 15 and 18 on the same grounds as Claim 9.

Claims 15 and 18, which claim QAM and QAM variants in the plurality of demodulation schemes, are dependent on Claims 10 and 16, respectively. The same arguments apply to them as for Claim 9 above. With the amendments introduced in Claims 10 and 16 it is believed that the grounds for rejection have been removed.

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Conclusion

Finally, in view of the foregoing demonstration of the failure of the cited prior art to provide a motivation or to disclose or suggest the various combinations of features of the invention claimed in the rejected claims, favorable reconsideration of this application, and a Notice of Allowability of all of Claims 1-6, 8-10 and 12-18 is respectfully requested.

Should any minor informalities need to be addressed, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Respectfully submitted,



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